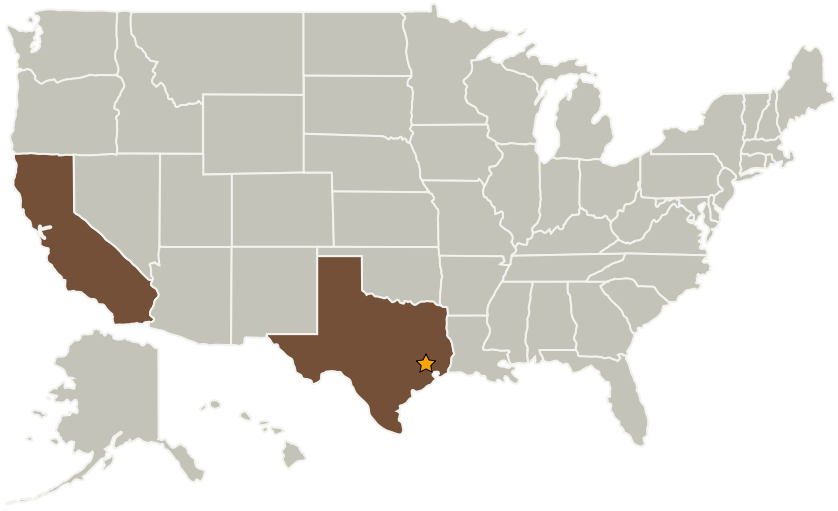
Flash 3D Enhancements for Autonomous Precision Landing and Hazard Detection and Avoidance, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

Advanced Scientific Concepts, Inc. (ASC) has developed a 128 x 128 frame, 3D Flash LADAR video camera which produces 3-D point clouds at 30 Hz. Flash Ladar Video Cameras are 3D vision systems that return range and intensity information for each pixel in real time. The ASC camera is the equivalent of 16000 range finders on a single chip. This allows the sensor to act as a 3D video camera with functionality well beyond just range finding. A previous Phase I EDL project used an ASC camera at the JPL mars yard to gather test data. Hazard Identification, and Entry Decent and Landing applications were investigated and the data demonstrated that a Flash LADAR system can resolve landing hazards and is suitable as an EDL sensor. In response to this solicitation ASC will study unit cell designs that will increase sensitivity and dynamic range and allow for more compact unit cells that will yield higher density arrays. The Phase two effort will yield a ROIC design and fabrication of a unit cell. The end result will be a ROIC design ready for Phase 3 production of a large area array. These improvements will increase the TRL level of this sensor.

Primary U.S. Work Locations and Key Partners



Flash 3D Enhancements for Autonomous Precision Landing and Hazard Detection and Avoidance, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

Flash 3D Enhancements for Autonomous Precision Landing and Hazard Detection and Avoidance, Phase I

Completed Technology Project (2008 - 2008)

Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Advanced Scientific Concepts, Inc.	Supporting Organization	Industry	Goleta, California

Primary U.S. Work Locations	
California	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Steve Silverman

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.5 Autonomous Rendezvous and Docking
    - TX04.5.1 Relative Navigation Sensors